

Claims

- [c1] 1.A semiconductor structure comprising:
a substrate;
a first layer over said substrate, said first layer comprising a first material having a first modulus of elasticity;
a first structure formed within said first layer, said first structure having an upper surface; and
a stress diverting structure proximate said first structure, wherein said stress diverting structure provides a low mechanical stress region at said upper surface of said first structure when a physical load is applied to said first structure.
- [c2] 2.The semiconductor structure of claim 1, wherein said first structure comprises a conductor.
- [c3] 3.The semiconductor structure of claim 1, wherein said stress diverting structure comprises a second material having a second modulus of elasticity less than said first modulus of elasticity, said second material selectively formed over said upper surface of said first structure for diverting mechanical stress created by said physical load applied to said first structure.

[c4] 4.The semiconductor structure of claim 1, wherein said stress diverting structure comprises a second material having a second modulus of elasticity greater than said first modulus of elasticity, said second material surroundingly encompassing said first structure for diverting mechanical stress created by said physical load applied to said first structure.

[c5] 5.The semiconductor structure of claim 1, wherein said stress diverting structure comprises a second material having a second modulus of elasticity less than said first modulus of elasticity, said second material selectively formed over said upper surface of said first structure for diverting mechanical stress created by said physical load applied to said first structure, and wherein said stress diverting structure comprises a third material having a third modulus of elasticity greater than said first modulus of elasticity, said third material surroundingly encompassing said first structure for diverting mechanical stress created by said physical load applied to said first structure.

[c6] 6.The semiconductor structure of claim 1, wherein said low mechanical stress region comprises stress values at levels below stress values in areas in said semiconductor structure unprotected by said stress diverting structure.

- [c7] 7.The semiconductor structure of claim 1, wherein said first structure is formed adjacent to said first layer.
- [c8] 8.The semiconductor structure of claim 1, wherein said stress diverting structure is cubical.
- [c9] 9.A semiconductor structure comprising:
a substrate;
an active device region embedded within said substrate;
a filler layer over said substrate, said filler layer comprising a material having a first modulus of elasticity;
a bondpad over said filler layer, wherein said filler layer comprises a plurality of metal/via levels formed upwardly from said active device region to said bondpad;
and
a shield configured over said active device region,
wherein said shield comprises a material having a second modulus of elasticity different than said first modulus of elasticity,
wherein said shield terminates at any of a first and second metal/via level above said substrate.
- [c10] 10.The semiconductor structure of claim 9, wherein said shield provides a low mechanical stress region on said active device region when a physical load is applied to said active device region.

- [c11] 11.The semiconductor structure of claim 9, wherein said shield comprises a material having a modulus of elasticity higher than said first modulus of elasticity.
- [c12] 12.The semiconductor structure of claim 9, wherein said shield comprises a material having a modulus of elasticity lower than said first modulus of elasticity.
- [c13] 13.The semiconductor structure of claim 9, wherein said shield comprises:
a first element having a modulus of elasticity higher than said first modulus of elasticity; and
a second element having a modulus of elasticity lower than said first modulus of elasticity.
- [c14] 14.The semiconductor structure of claim 10, wherein said low mechanical stress region comprises stress values at levels below stress values in areas in said semiconductor structure unprotected by said shield.
- [c15] 15.The semiconductor structure of claim 9, wherein said shield is cubical.
- [c16] 16.A method for forming a stress diverting semiconductor structure, said method comprising:
forming a first layer adjacent to a substrate, said first layer comprising a first material comprising a first modulus of elasticity;

forming a first structure within said first layer, said first structure comprising an upper surface; and
forming a stress diverting structure proximate said first structure, wherein said stress diverting structure provides a low mechanical stress region at said upper surface of said first structure when a physical load is applied to said first structure.

[c17] 17.The method of claim 16, wherein said forming of said first structure comprises forming a conductor.

[c18] 18.The method of claim 16, wherein said forming of said stress diverting structure comprises selectively forming a second material comprising a second modulus of elasticity less than said first modulus of elasticity over said upper surface of said first structure for diverting mechanical stress created by said physical load applied to said first structure.

[c19] 19.The method of claim 16, wherein said forming of said stress diverting structure comprises surroundingly encompassing a second material comprising a second modulus of elasticity greater than said first modulus of elasticity around said first structure for diverting mechanical stress created by said physical load applied to said first structure.

[c20] 20.The method of claim 16, wherein said forming of said stress diverting structure comprises selectively forming a second material comprising a second modulus of elasticity less than said first modulus of elasticity over said upper surface of said first structure for diverting mechanical stress created by said physical load applied to said first structure, and wherein said forming of said stress diverting structure comprises surroundingly encompassing a third material comprising a third modulus of elasticity greater than said first modulus of elasticity around said first structure for diverting mechanical stress created by said physical load applied to said first structure.

[c21] 21.The method of claim 16, wherein said low mechanical stress region comprises stress values at levels below stress values in areas in said semiconductor structure unprotected by said stress diverting structure.

[c22] 22.The method of claim 16, wherein said first structure is formed adjacent to said first layer.